PALESTINE

DEPARTMENT OF AGRICULTURE AND FISHERIES

ANNUAL REPORT

FOR THE YEAR

1941-42

(YEAR ENDED MARCH 31, 1942)

Price 225 Mils

To be purchased from the Government Printer, Jerusalem,
or from the Crown Agents for the Colonies, 4 Millbank,
Westminster, London, S.W. 1, England.

No. 10 of 1943.

PRINTED BY THE GOVERNMENT PRINTER, PALESTINE.

ANNUAL REPORT

OF THE

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FOR THE

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GENERAL SURVEY.

The response to the appeal to farmers for increased production of food had most gratifying results. Their efforts, combined with favourable weather conditions, caused a considerable increase in the production of vegetables and in the expansion of the area under wheat and barley which indicated heavy yields at the end of the period under review. Government contiued to assist farmers by loans and distribution of vegetable seedlings and day-old chicks. Despite the shortage of tractors, fertilizers and pipes for extension of irrigation, the year was one of continued progress and intense activity. The citrus industry, however, again suffered the loss of the export market.

SECTION I.

AGRICULTURE AND FISHERIES IN PALESTINE, 1941-42.
MAJOR CROPS AND INDUSTRIES.

The Citrus Industry.

Area under Citrus.

2. No permission was granted for the planting of new citrus areas but on the other hand uprooting of groves continued. About 6,000 dunums were uprooted during the year, these uprooted areas being in most instances used for the production of vegetables. Citrus wood found a ready market, mostly as fuel, and the sale of such wood usually more than covered the cost of uprooting.

3. As regards the total citrus area, which was estimated in 1939 at about 299,500 dunums made up of 242,500 dunums of oranges, 37,500 dunums of grapefruit, 5,000 dunums of lemons and 14,500 dunums of other citrus, it was estimated in the spring of 1942 that 15,110 dunums had been uprooted since 1939, 6,700 dunums were in very poor condition, 16,980 dunums were in poor condition and 4,230 dunums had been cut back or topworked.

Citrus Cultivation.

4. The general standard of cultivation of groves deteriorated further during the year, particularly in groves in medium or poor condition.

5. The loans in 1941, which helped considerably in the upkeep of groves, were given to credit-worthy owners of bearing groves in relatively good condition to enable them to carry out essential work, particularly cultivation and irrigation. A large proportion of the planted area, namely some 175,000 dunums, was assisted, the advance per dunum being £P.3.200 mils, except that for portions of groves in excess of 100 dunums, which areas totalled 21,500 dunums, the loan was at a reduced rate of £P.2.200 mils. Some 16,000 dunums, representing 700 groves which were found to be in good condition, were not assisted as the owners did not apply for loans.

6. The reduced standard of cultivation was particularly apparent in the lack of pruning, manuring and soil cultivation. By the end of 1941, very few groves were still in really good condition and the effect of lack of fertilizers, especially nitrogen, was very evident throughout the citrus area, particularly in groves on lighter soils.

One Palestine Pound (£P.) = 1,000 mils = One Pound Sterling.
One Dunum (metric) = 1,000 square metres = 0.2471 acre.
Throughout this report the term "Ton" means the metric ton of 1,000 kilogrammes.

7. There was scarcity of labour owing to employment on Army works and in factories, and the rates of pay of grove labourers rose during the year from 75 per cent. to 100 per cent.

8. The top-working of citrus, mainly grapefruit, continued, but large areas were seldom involved.

9. In some areas the growers carried out a considerable amount of severe "heading-back", the idea being that trees so treated need less water and that intercropping with vegetables is made possible. This compromise is not always satisfactory from the standpoints of either the grove or of vegetable cultivation.

The Citrus Crop.

10. The 1941 bloom was very irregular and a smaller crop was set than in 1940. A revised estimate of the total crop made in February, 1942, was as follows: Shamouti oranges, 9,000,000 cases; grapefruit 550,000 cases; Valencia oranges, 250,000 cases; and lemons, 70,000 cases. It was estimated that about 20 per cent. of the crop was of a quality which would have been unsuitable for export.

Export and Disposal of the Citrus Crop.

11. Exports of cased fruit by private merchants were on a very small scale; most of the cased exports were made by the Army authorities to meet their requirements in the Middle East. Exports of fruit in bulk to neighbouring countries were, however, on a larger scale than in the previous season; this was attributable to the opening up of the Syrian market and to the requirements of the Army in Iraq and Egypt; in addition, the citrus crop in Egypt was smaller than usual and the Egyptian import duty was reduced from £E. 7.500 to £E. 4 per ton from the 1st April, 1942, for the balance of the season.

12. The following tabular statement summarises the general position regarding export and disposal of the 1941-42 crop:—

Citrus Fruits. *For the Season 1941/42.* (*)	1941/1942	
	Cases	Value £P. F. O. B.
Oranges	173,631 (**)	124,455
Grapefruit	3,577	1,967
Lemos	30	16
Others	—	—
Total exports in cases	177,238	126,438
Exports in bulk (14,300 tons) (***) estimated to be equivalent to ...	357,000	107,100
Estimated local consumption, equivalent to	2,500,000	300,000
TOTAL	(estimate) 3,034,238	533,538

(*) 1.6.41 to 31.5.42.

(**) Includes 79,962 cases of Valencia oranges of 1940/41 crop exported in June and July, 1941.

(***) *Bulk Exports*:

Syria	8,200 tons
Egypt	4,700 tons
Iraq	1,100 tons
Lebanon	300 tons
Total	14,300 tons.

13. The demand of the Army authorities absorbed a large proportion of the Valencia orange crop. The earlier estimate of this crop was too high; the total probably did not exceeed 15,000 cases.

Citrus Marketing Control.

14. The provisions of the Citrus Marketing Order (No. 2), 1941, gazetted on 27.11.41 followed very closely those of the previous Order. Some modifications were, however, introduced in respect of the fees; the fodder fee was reduced from £P.0.500 mils to £P.0.250 mils per ton and, whilst the rate per packed case remained at 120 mils, a special rate of 90 mils was introduced for cased fruit consumed locally by the Army; the rates of £P.2 per ton in bulk for human consumption and £P.1 per ton for citrus products manufacture remained unchanged. Provision was also made for the issue of Disposal Permits on credit terms.

15. Indirect assistance was given to small scale producers of citrus essential oils by specifically exempting from the provisions of the Order producers working in groves and expressing the oils only by means of hand-operated devices.

Citrus Products.

16. There was a further increase in production of citrus products during the 1941-42 season. In order to economise in shipping space the export of raw juice to the United Kingdom was not permitted; in consequence, exports to the United Kingdom, the principal export market, consisted of concentrated juice and essential oils. Considerable quantities of preserved and pasteurised raw juice, marmalade and squashes were also manufactured to meet local civilian and Army requirements; in addition, smaller quantities of other products were manufactured, such as alcohol, citric acid, dried peels for fodder, canned grapefruit, pectin raw product and liquid pectin. There was an increased use of citrus fruit as fodder, both for feeding as fresh fruit and as silage.

17. As regards concentrated juice production there had prior to 1941 been only one major and one minor producer. During the year, apart from the operation of two new plants of small capacity, four new larger juice concentrating plants were erected but only three of these commenced operation and they only came into production late in the season. Exports totalled some 130,000 gallons shipped as equivalent to 3 to 1 concentrate and some 20,000 gallons of around 7 to 1 concentrate, the price received being based on a price of 21s. cost and freight per gallon of 7 to 1 concentrate. This concentrated juice production represented the utilisation of about 250,000 cases of fruit of the total quantity of about 500,000 cases absorbed by the products factories.

18. The production of essential oils, nearly all of which was exported to the United Kingdom, totalled around 55 tons of orange oil, 16 ton of lemon oil and 1 ton of grapefruit oil. Towards the end of the season the following maximum f.o.b. prices per lb. of oil were fixed officially for export to the United Kingdom:— Lemon oil 30s. and orange and grapefruit oils 17s. Owing to shortage of suitable metal containers, much of the oil was shipped in beer bottles. The larger proportion of these quantities of essential oil was produced by hand-operated presses in the groves (the balance in the products factories) and it is considered that about 1 million cases of fruit were used in the groves for oil extraction.

Citrus Control Board.

19. The Citrus Control Board, which commenced operation in December, 1940, held ten meetings during the year under review. The principal matters considered by the Board were:— Citrus loans, registration of groves, export to neighbouring countries, the possible use of palm leaf crates, assistance with Army contracts, taxation of groves in urban areas, control of planting of citrus, and research work on citrus wastage and on *Pseudococcus comstocki* the latter including distribution of the *Clausenia* parasite.

20. The registration by the Board immediately after its establishment of all citrus groves in the country, the preliminary work for which registration was begun towards the end of 1940, was of great assistance when the staff of the Board undertook the office work of handling applications for the 1941 citrus loan prior to their transmission to the joint Loan Committees of the Government and the Banks. The staff of the Board, which also undertook the office work of the Citrus Marketing Board, was principally engaged during the year, apart from work with grove registration and loan work, on Army contract arrangements, particularly with the Valencia orange contract, distribution of marketing fee proceeds to growers, general administration of the citrus marketing control and scrutiny of applications for export and import of citrus fruit. The Chief Horticultural Officer continued to act as Manager of the Board.

Citrus Marketing Board.

21. The re-appointment of the Citrus Marketing Board under the Defence Regulations was gazetted on the 27th November, 1941. The forms of reference of the Board were:— "To take such steps as the Board may deem requisite to control or regulate the marketing of citrus fruits grown in Palestine and generally to control or regulate the marketing in Palestine of all citrus fruit and any product thereof."

22. The Board held 14 meetings during the year under review, the principal questions considered being the revision of the Citrus Marketing Order for the 1941-42 crop season, miscellaneous matters concerning operation of the marketing control, methods of disposal of the surplus crop, exports to neighbouring countries, distribution of the fees collected amongst growers and general arrangements between contractors and the Army authorities to ensure regular supply to the Army and as far as possible fair division of orders amongst the growers. During the 1941-42 crop season, the Board made provision for the employment of some 90 supernumerary police to assist the regular police in enforcement of the marketing control and the staff of the Board also rendered much assistance in this connection.

23. The sum of £P.40,000, from the total of £P.51,000 collected as fees during the 1940-41 crop season after the enactment of the Citrus Marketing Order at the end of January, 1941, was distributed to all owners of groves in bearing at the rate of 150 mils per dunum of bearing grove. The fees in the 1941-42 season to the end of March amounted to around £P.70,000, the total for the whole season being about £P.120,000. The Fruit Inspection Service undertook as in the 1940-41 season the collection of fees at all the principal permit-issuing offices.

Rural Property Tax.

24. The rate of Rural Property Tax for citrus was, as in 1940-41, scheduled as nil for the whole country for the 1941-42 tax year beginning in April on account of the considerable fall in crop value.

Wheat.

1940-41 *season.*

25. Heavy rains at the beginning of March were more than offset by late *Khamsin* winds which led to outbreaks of rust and to poor yields generally. Australian and North African semi-soft wheats are increasing in popularity. C.C.C. wheat again showed results far superior to local strains. Total yield was 90,000 tons.

1941-42 *season.*

26. In parts of the grain area the rainfall during December was the heaviest for 20 years. Frost and abnormal snow-falls were experienced in the hills, and unusually mild spells occurred in January and February. In those regions where moisture conserved in the ploughed soil was sufficient to maintain crops in good condition, the outlook at the close of the period was good. There were heavy infestations by ed-Duda (*Syringopais temperatella*) but in the main results were far more promising than those of the previous year.

Barley.

1940-41 *season.*

27. Yields were poor for reason similar to those affecting wheat. Total yield was 69,000 tons.

1941-42 *season.*

28. Barley was more affected by the drought than wheat but at the close of the period under review the crop prospect was most favourable owing to an exceptionally good crop in the Beersheba area.

Pulse Crops.

29. In the hills the main crops, horse beans, lentils and bitter vetch (kersanna), were poor, but in the plains yields approached average.

Vegetables.

30. Again there was a high increase in areas owing to extension of irrigation through Government loans. The raising of seeds and distribution of seedlings was vigorously undertaken at Government stations. In parts of the country the tomato crop was damaged by frost. Yields of vegetables generally were high but the pressure of demand was considerable owing to the absence of imports.

Summer Crops.

31. Heavy yields of maize, sesame, dura and chick-peas were general except in the Gaza district. The prohibition placed upon the export of melons had the desired effect of increasing the area under dura and sesame. The latter crop was particularly successful.

Forage Crops.

32. Yields generally were fair to good. There was considerable expansion in the area under green fodder and a gradual increase in permanent pastures.

Potatoes.

33. The spring crop 1940-41 was poor owing to heavy infestation by tuber moth and poor quality seed. The 1941-42 crop was also affected adversely by the lack of suitable seed.

Groundnuts.

34. There was some increase in the area under groundnuts; this might have been larger but for the difficulties of extending irrigation from existing wells, and of obtaining irrigation fittings. A shortage of agricultural labour affected groundnuts in common with other intensive crops.

Fruits other than Citrus.

Deciduous Fruits.

35. Great interest was shown in further plantation of deciduous fruit trees, particularly plums, apples and pears; it is estimated that about 1,000 dunums were planted with such trees in early 1942. Weather conditions during the year under review were not very favourable. The mild winter of 1940-41 caused delayed foliation, irregular flowering and a poor set; the *Khamsins* later further reduced the set of fruit and caused severe damage to small fruits and as a result nearly all crops were below normal. Yields of plums were generally poor; the apricot crop was very poor; there was a better set of fruit with apples and pears though the yields were somewhat below normal. Cold storage of apples and pears for up to 6 months or longer is becoming more popular; several hundred tons of fruit were kept in cold storage in the 1941-42 season. Production of plums, apples and pears in the 1941-42 season was estimated as follows:— Plums 250 tons; local variety apples, 2,500 tons; European variety apples, 1,000 tons; and pears 125 tons. Prices were generally high.

Olives.

36. The 1941-42 olive crop was very poor except in the Northern districts though even there the crop was below normal. Following the generally very good crop of 1940-41, the set was well below average and the crop was later further reduced by the severe *Khamsins* which occurred during the blossoming period. Only about 2,000 tons of oil were produced and the quantity of olives which was pickled was very limited. The price of green olives for pickling was very high, being as much as 80 mils per kilo. Olive oil prices which were also very high varied considerably; industrial oil fetched an average of from £P.80 to £P.100 per ton; edible oil prices ranged between £P.120 and £P.180 per ton. There was a big demand for budded olive trees but the supply was very limited; only 4,000 budded trees were available in the nurseries; there was, however,

a considerable increase in planting of olive suckers. A marked progress in nursery propagation of olive trees is to be recorded; propagation by seeds instead of by suckers is being introduced very successfully; vegetative propagation by wiring and mounding has also given promising results.

Bananas.

37. The banana groves developed normally until the 1940-41 winter when they were damaged in the coastal area and in the upper Jordan Valley by a December frost; along the coast the frost caused browning of the plants but in the upper Jordan Valley the damage was less severe being estimated at only around 10 per cent. In Jericho, abnormally cold winds during the winter severely affected plant growth, reducing the crop and checking fruit blossoming. The area under bananas has increased by 400 dunums in the upper Jordan Valley and by about 100 dunums along the coast. The banana plantations have recntly been maintained in better condition and in consequence higher yields are being obtained. The total yield for 1941 may be recorded as about 1,000 tons from the coastal area, 2,500 tons from around Tiberias (upper Jordan Valley area) and 3,000 tons from the Jericho area — a total of about 6,500 tons. There were no imports and banana prices kept at a high level throughout the year, ranging from £P.15 to £P.28 per ton of green bananas. There was some manufacture of a raffia substitute from the stems of felled banana plants. Some stems were used as green fodder for cattle.

Grapes.

38. Grape production was normal in most areas, European varieties setting a good crop. The grapes matured earlier than usual; the early varieties of grapes grown in the Jordan Valley ripened in the third week of May. About 6,000 tons of grapes were used for wine production and the price of wine on the local market was very good. Grape prices were also good; local varieties sold at 8 to 12 mils per kilo, late Ramallah grapes fetched 12 to 25 mils per kilo, whilst the average price for European varieties ranged from 13 to 23 mils per kilo. Planting of vines is extending throughout the country; over 170,000 grafted vines were sold by the nurseries. The high prices received for grapes as fresh fruit discouraged the production of raisins and other grape products.

Sub-Tropical Fruits.

39. The fig crop was generally normal and fig drying is making rapid progress in the Ramallah and Safad Sub-Districts; large quantities were sold on the local market at good prices and there were some exports to Egypt. Increased interest in planting drying varieties of figs is to be noted. The extension of date plantations is still restricted owing to the very limited supply of date off-shoots. Increased supplies of locally grown loquats, avocadoes, mangoes, guavas and annonas were marketed.

Poultry and Beekeeping.

40. Owing to the scarcity of imported food concentrates, there was some decrease in the size of flocks. Production costs rose but there was a corresponding increase in market prices for eggs and meat.

41. During the season February — June, the Government hatcheries at Jerusalem and Acre incubated 482.000 eggs from which 205.000 chicks were hatched and distributed to Arab farmers for raising under "back-yard" conditions. The stamina of the chicks was good, as evidenced by low mortality and successful rearing; purchasers of chicks received issues of Government-controlled maize at a nominal price. The operation of the hatcheries resulted in an important increase in the supply of eggs and poultry meat for the market.

42. A quantity of 214.700 kilogrammes of damaged sugar was distributed to beekeepers at the rate of 7.5 kilogrammes to each strongly-populated hive. Cyano gas was distributed gratis for the destruction of hornets.

43. The production of honey was fairly good and estimated to be the same as last season, 400 tons.

SECTION II.

WORK OF THE DEPARTMENT OF AGRICULTURE AND FISHERIES AND OF THE GENERAL AGRICULTURAL COUNCIL.

Establishment of Department at Close of Year.

Director	— Major F.R. Mason.
Deputy Director	— Mr. D. Stedman Davies.
Chief Agricultural Officer	— Mr. G.G. Masson.
Chief Horticultural Officer	— Mr. A.C. Shill.
Chief Plant Protection Officer	— Dr. J.E. Hardy.
Chief Fisheries Officer	— Dr. G.C.L. Bertram.

Agricultural Service.

44. The activities of the Agricultural Service were increased by war-time duties connected with the issue of Government loans, the estimation of crops under the Government control scheme, valuations arising from Army requisitions, and inspections and recommendations for the release of controlled materials.

45. Work at Government stations progressed favourably with the emphasis on seed increase of selected cereals and vegetables. Experiments, in co-operation with Jewish settlements, were continued and extended with good results.

Horticultural Service.

Horticultural Stations.

46. Normal activities were maintained during the year in all Horticultural Stations, namely at Acre, Sarafand, Majdal, Nablus, Ein Arrub, Farradiya, Farwana and Jericho. New plots of fruit trees were planted out for trial or demonstration purposes in most stations. The stations have now recovered from their neglect during the period of disturbances from 1936 — 1939 and all damage has been repaired. The records of growth and yield which could not be taken during this period were resumed.

Fruit Tree Nurseries.

47. Propagation work continued in the nurseries of the Acre, Sarafand, Jericho and Nablus Stations. Nursery production in 1941-42 was as follows:— 27,000 grafted vines, of which 20,400 were sold and 4,700 distributed free; 29,500 fruit trees, of which 15,630 were sold, 4,050 distributed free and 5,230 replanted; in addition, 7,000 stocks were raised and distributed.

Other Horticultural Activities.

48. In view of war-time conditions, Horticultural Officers continued to devote much of their time to activities relating to production, particularly to work in connection with olive oil, fruit by-products and increased production of bananas and other fruits. Investigation work was undertaken regarding improvement of the quality of the olive oil of the country and the results obtained were of value in explaining to oil producers the factors which cause high acidity in olive oil. Other investigation work and activities were — a study of blossoming and foliation of deciduous fruit trees with a view to determining the varieties most suitable to different sections of the country; investigation of maturity standards for Palestine-grown table grapes; a study of local flowering and maturing of bananas; demonstrations in pruning of fruit trees and vines; the establishment of demonstration plots of American grafted vines; and inspection of private nurseries. Ten broadcast talks were prepared during the year on horticultural subjects.

Fruit Inspection Service.

Grove Inspections for the 1941-42 *Loans.*

49. Towards the end of the 1940-41 season, the Fruit Inspection Service proceeded to inspect and judge all the citrus groves in the country in connection with the grant of loans as cultivation advances. The inspection of these groves, some 14,000 in number, was completed in about 6 weeks though senior members of the staff were, however, engaged until mid-August on re-inspection of groves in connection with appeals against previous judging.

General Citrus Survey.

50. After the completion of the 1941 loan inspection, the personnel of the Fruit Inspection Service resumed work on the general citrus survey which was continued throughout the summer months. Some 9,110 additional dunums were surveyed and the revision carried out over an area of 29,838 dunums which was first surveyed 6 or 7 years earlier.

Citrus Marketing Order.

51. During the 1941-42 crop season, the offices for issue of permits under the Citrus Marketing Order at Acre, Haifa, Tulkarm, Hadera, Petah-Tiqva, Jaffa, Tel Aviv, Ramle, Rehovot and Gaza were again staffed by officers of the Fruit Inspection Service who also attended part time at the offices at Nazareth, Tiberias, Affule and Benyamina; the offices at Nathanya and Jericho were staffed by other Government officers.

Inspection of Fruit.

52. Consignments of fruit for export were inspected as required. Deliveries of fruit under Army contracts were by arrangement also inspected even if for destinations ordinarily exempt from inspection.

Citrus Wastage Investigation.

53. Arrangements for the research work on citrus fruit wastage, which is carried out at the Agricultural Research Station, Rehovot, are now made by the Citrus Control Board which also finances the work. A report on the work carried out in the 1940-41 research year (ending in September) was prepared by the Chief Horticultural Officer, Acting Manager of the Board, and submitted to the Board in September, 1941. The work was continued in 1941-42 with a budgeted expenditure of £P.1,985 (£P.1,538 in 1940-41).

Plant Protection Service.

Identifications.

54. No consignments of insects were sent to the Imperial Institute of Entomology for identification; 2 consignments of identified insects were received including 5 species of *Diptera* new to the British Museum. The Chief Plant Pathologist of the Agricultural Research Station at Rehovot made 17 identifications of diseased plant material.

Research and Investigations.

55. (a) *Pseudococcus comstocki.* The intensity of the attack in citrus groves of the mealybug, known in Palestine as *Pseudococcus comstocki*, again diminished and although the area of infestation increased, this pest nowhere presented an economic problem at the close of the period under review.

The mass breeding of the chalcid, *Clausenia purpurea*, introduced from the Far East in 1940, continued, and some changes in the technique enabled an increased production to be made. Over 100,000 adult parasites were liberated in selected groves. The results so far appear to be very satisfactory as the parasite has spread considerable distances from the liberation points and, in some places, the parasitism has risen to 90-100 per cent.

Experiments showed that budwood treated with a 15 per cent. solution for 15 minutes at 50° F. and citrus seedlings immersed in a light oil in which is incorporated di-nitro-ortho-cresol killed the mealybugs without impairing the vitality of the plants.

(*b*) *Deciduous Fruit Trees.*

(i) *Capnodis carbonaria* Klug. On the basis of laboratory experiments carried out in the previous season, large scale experiments in control were set up in various parts of the country; these consisted in depositing a layer of fine sand for varying distances around each tree. The results of these experiments cannot be ascertained for some time.

(ii) *Carpocapsa pomonella* L. Experiments with various insecticides against the Codling Moth were continued. Two mixtures, zinc arsenate 0.7 per cent. plus agral .025 per cent. in water and aluminium arsenate 0.4 per cent. plus agral .025 per cent. in water gave results comparable to the usual mixture of lead arsenate and agral. Spraying with cryocide 1 per cent. plus summer oil 1 per cent. in water, either for the whole spray period, or as end sprays following lead arsenate, gave best results. This use of cryocide is valuable in providing a spray which leaves no arsenical residues.

(iii) *Ceratitis capitata* Wied. The Mediterranean Fruit Fly continues to be, with Capnodis, a major pest on stone fruit trees. The addition of 0.4 per cent. dicandiamide increased the efficiency of spot sprays consisting of copper carbonate 0.8 per cent. plus zinc sulphate 0.8 per cent. plus sugar 4 per cent. in water. Good results were also obtained from a mixture zinc arsenate 0.7 per cent. plus dicandiamide 0.4 per cent. plus sugar 4 per cent. in water. These sprays will be tested again in the coming season and the control obtained by tartrate sprays will also be investigated.

(iv) *Parlatoria oleae* Colv. The investigation of the control of the Chaff Scale on apple trees was continued. It is now considered that for full control there should be a pre-winter spray of a 5 per cent. winterwash or 6 per cent. ovicide tar oil solution followed by a second spray in spring. It appears that in winter the Scales are more resistant to spray as 20 per cent. survivors are left compared with only 5 per cent. survivors left by the spring spray.

(v) *Virachola livia* Klug. In four widely separated localities pomegranate trees were sprayed for control of Pomegranate Butterfly with a mixture containing sodium fluosilicate 125 grammes, lime 140 grammes, agral 125 grammes, flour 25 grammes and talc 400 grammes in each 4 gallons of water. This spray is reported to give good results in Egypt and had proved successful in a small scale trial the previous year in Palestine. 70 per cent. clean fruits were obtained, while untreated trees bore less than 30 per cent. clean fruits; unfortunately there was considerable splitting of fruits followed by rot. It is difficult to account for this as in some areas the humidity was continuously low with no formation of night dew. In the coming season sodium fluosilicate will be substituted by barium fluosilicate.

Dusting with a mixture of barium fluosilicate and talc in equal proportions gave inconclusive results but no fruit cracking was caused.

(*c*) *Cereals.*

(i) *Syringopais temperatella.* The investigations into the ecology of this wheatleaf borer have made considerable progress. By means of an apparatus devised to separate out the microfauna of soil samples it has been discovered that the primary aestivating larvae lie chiefly at a depth of 17-20 centimetres. The Arab plough does not penetrate deeply enough to disturb these larvae; there is also some evidence that aestivating larvae can remain in diapause for more than one season.

(ii) *Stored Grain Pests.* The progress of these investigations has not been very satisfactory owing to the lack of suitable stores in Palestine where grain can be given treatment. Results obtained from an experimental silo showed that untreated grain can be successfully stored under proper conditions without the development of pests, while treatment with Katelsousse is satisfactory in any store where the humidity can be kept low and the grain is clean prior to treatment.

(*d*) *Potatoes.*

Pthorimea operculella Zell. In an investigation into the effectiveness of insecticides against the attack of Tuber Moth on potatoes stored in sacks placed in open sheds, it was found that the additions of 100 grammes Cymag to every 100 kilogrammes of tubers gave 85.3 per cent. clean potatoes free from rots (total number of tubers 2,258), while fumigation with carbon disulphide at the same rate was not quite as effective. The addition of napthalene flakes at the rate of 40 grammes to each sack of 25 kilogrammes gave 76.6 per cent. of clean tubers out of a total of 1,200; the addition of hexachlorethane appeared to give no control; untreated potatoes contained 53.2 per cent. of clean tubers.

(*e*) *Miscellaneous.*

Throughout the year there have been indications from neighbouring countries that an invasion of *Schistocerca gregaria* Forsk may occur in the near future. Preparations for anti-locust measures consisted in the purchasing and preparing of anti-locust material, simple training of Government and Police personnel, and meetings with entomologists of neighbouring countries to ensure cooperation in the event of a campaign.

Plant Pathology.

56. Experimental plots in which the soil was sterilised by boiling water resulted in satisactory control over the "damping-off" of tobacco seedlings.

57. Routine demonstrations in various districts of the country were carried out against Mildews, Rusts, Leaf Spot and fruit tree Scab. Routine identifications were made and in this the help of the Chief Plant Pathologist, Rehovot Agricultural Reseach Station, was often invaluable.

Extension.

58. In preliminary field trials it was found that 5 per cent. Universal wash and 5 per cent. winter wash apparently gave fair results against *Asterolecanium pustulatus* Ckll. on fig trees.

59. Modifications of the treatment against *Polychrosis botrana* Shiff. on grapes showed that two dustings with a mixture of barium fluosilicate 30 per cent. plus sulphur 70 per cent. following a preliminary sulphur dusting gave almost as good results as the usual mixture containing equal proportions, while considerably reducing the present cost of control.

60. Preliminary field trials on a small scale were also carried out against *Anarsia lineatella* on peaches, *Eriosoma lanigera* on the roots of apple trees, *Myopardalis pardalina* Big. and *Raphidopalpa foveicollis* Luc. on melons and cucumbers.

Plant Quarantine.

61. A total of 2,570 incoming consignments of plants were examined; of these 267 were fumigated before entry was permitted and 17 were confiscated. 748 consignments for export were inspected and of these 548 were fumigated.

62. 93 nurseries are now licensed for distribution of stock, 19 new nurseries being registered during the year.

Fisheries.

63. In the year under review the total catch of fish from the sea and inland waters was rather more than 1,770 tons. The slight decrease of 200 tons from the previous year was mainly due to the prohibition on lampara fishing and the absence of foreign landings. The cash value of fish was greatly enhanced.

64. Local trawling, for the promotion of which Government loans were granted, is now equally important with line fishing; 9 different vessels were at work but 2 of these were lost. Judged as an increase of food production, however, landings were disappointing and this is also true of the effect of loans to shore-fishermen. One interesting development has been the construction of small vessels in concrete.

65. Freshwater fisheries show a further increase of landings from Lake Tiberias—67 tons more than in 1940-41—and a parallel increase of 58 tons from carp ponds. The area of ponds increased from some 500 dunums to 1,200 dunums with the assistance of Government loans. Catches from Lake Huleh and the Huleh area declined; the total landings, however, from fresh waters was about 100 tons higher than in the previous year.

Kadoorie Agricultural Schools.

66. At the Kadoorie Agricultural School, Mount Tabor, a normal year was completed in both studies and practical work. At the end of the period under review there were fifty students in residence, of whom 27 were in the first, and 23 in their second year; 21 students were granted diplomas at the conclusion of the school year in August

1941. A full programme of farm work was carried out and certain improvements were made. 10 dunums of land were reclaimed and planted to fruit and vineyards, and an area of 4½ dunums was prepared for an arboretum in which 300 metres of stone wall terraces were erected. Livestock was increased by the transfer of the Guernsey herd from the Stock Farm, Acre.

67. In April, 1941 the buildings of the Kadoorie Agricultural School, Tulkarm, were taken over from the military; repairs and overhauls were immediately put in hand. Vacant posts were filled and a summer refresher course of six weeks was attended by 9 students who had completed their first year in 1938. The nucleus of a livestock section was supplied by the Stock Farm, Acre, and the School reopened on the 1st October with 41 students. Certain improvements to the grounds were effected.

General Agricultural Council.

68. The Council held seven meetings during the year and considered reports from its committees on a variety of matters. These included the olive oil industry; trade with Syria; draft legislation concerning irrigation and drainage; war damage draft legislation; and the increase of food production. A number of other problems relating to the war situation were also examined and recommendations submitted to Government. Measures for the reconstitution of the Council were incorporated in new standing rules gazetted on the 8th January, 1942. The ten standing committees reporting to the Council were dissolved, and in their place a panel of committeemen was set up from whom committees should be appointed as the need arose to deal with specific problems referred to them by the Council.

SECTION III.

Agricultural Legislation.

69. The Fisheries Amendment Rules, 1941, were designed to control the import and introduction of non-indigenous fishes; and also to give effect to the new policy at Lake Tiberias by regulating the mesh sizes of nets, minimum sizes of fish to be landed, and by establishing statistical control posts. Former prohibitions on fishing in certain areas of Lake Tiberias were abolished as unworkable.

70. The Chief Fisheries Officer was made licensing authority for fish ponds under the Public Health (anti-malaria) Rules, 1941. The Fisheries Amendment Ordinance, 1942, provided for the enforcement of rotas in any fishery, jointly by the District Administration and the Chief Fisheries Officer.

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Jerusalem.
10*th May*, 1943.

GPP. 18356—340 Bks.—15-7-43